

**What is claimed is:**

1. Radial fan with a casing (1, 2) and in it an axially arranged fan wheel (3), wherein the casing has an axially placed air inlet (4), an exhaust (5), a bottom section (6) with a bottom reference surface (7) and a spiral-shaped compression space located  
5 radially around the wheel that extends to the exhaust and which expands both in a radial as well as an axial direction towards the exhaust (6);

and the wheel (3) has a cover disk (11) facing the air inlet (4) and a supporting disk (12);

wherein an axial and radial extension on the casing is formed over at least 180°  
10 of the spiral circumference; and

a hollow cylindrical cup-like section (9) is recessed in the bottom section (6) in an axial direction extending beyond the bottom reference surface (7) in which the wheel (3) is placed in such a way that an inner side (12a) of the supporting disk (12) of the wheel (3) is flush with the bottom reference surface (7).

15 2. Radial fan as claimed in claim 1, characterized in that the compression space (8) expands in an axial direction beyond the bottom reference surface (7).

3. Radial fan as claimed in claim 1, characterized in that the casing has a cover (2) and the compression space expands in an axial direction into the cover (2).

20 4. Radial fan as claimed in claim 1, characterized in that the wheel (3) has blades (13, 14) that have a swept-back outer edge (16) along the wheel's circumference (15).

5. Radial fan as claimed in claim 4, characterized in that the outer edge of the blades (16) of the blades (13, 14) extend in a radial direction beyond the circumference (15) of the cover disk (11) and the supporting disk (12) of the wheel.

25 6. Radial fan as claimed in claim 4, characterized in that the blades (13) are curved backwards in relation to the wheel's (3) operating direction of rotation.

7. Radial fan Radial fan as claimed in claim 4, characterized in that the outlet angle ( $\beta_2$ ) which forms a tangent (T1) at the outer edge (16) of the blade (13, 14) with a tangent (T2) on the circumference (15) of the wheel (3) at a point on the outer edge (16) that is smaller than 35°.

8. Radial fan as claimed in claim 4, characterized in that the inlet angle ( $\alpha_1$ ) which forms a tangent (T3) at the inner edge (18) of the blade (13, 14) with a tangent (T4) on the circumference of the wheel (3) at a point on the inner edge (18) amounts to 17-35°.
9. Radial fan as claimed in claim 4, characterized in that at least a part of the blades (13, 14) is curved in an S-shape when observed from a top view and has an outlet angle ( $\alpha_2$ ) smaller than or equal to 90°.
10. Radial fan as claimed in claim 4, characterized in that shorter (14) and longer (13) blades alternate in their arrangement in the wheel (3).
11. Radial fan as claimed in claim 1, characterized in that a tab (18) is placed in the casing (1) which essentially extends in the circumferential direction in the compression space (8), and a guide edge (20) formed by the tab (18) in a lateral projection forms different angles with the bottom reference surface (7) of the fan.
12. Radial fan as claimed in claim 11, characterized in that the guide edge (20) in lateral projection forms at least one step for which over a section of the guide edge (20) the angle with the bottom reference surface (7) is essentially 90°.
13. Radial fan as claimed in claim 11, characterized in that the guide edge (20) in lateral projection forms at least one plateau for which over a section of the guide edge (20) the angle with the bottom reference surface (7) is essentially 0°.
14. Radial fan as claimed in claim 11, characterized in that the vertical area of the guide edge is 4 mm in height, the plateau extends approximately 12 mm above the bottom reference surface over a distance of approximately 18 mm, the inclined area of the guide edge is 20 mm measured from its beginning at the bottom reference surface to the step and the height from the plateau to the upper end of the guide edge e.g., is 16 mm wherein all measurements refer to a outlet width of approximately 12 mm from the wheel.
15. Radial fan as claimed in claim 11, characterized in that the guide edge (20) has a projection (21).
16. Radial fan as claimed in claim 1, characterized in that the wheel (3) has blades (13, 14) that have a swept-back outer edge (16) along the wheel circumference (13) and the blade tip (17) along the outer edge (16) does not have the same orthogonal distance to the bottom reference surface (7) as the tip of the projection (21) of the

guide edge (20).

17. Radial fan as claimed in claim 1, characterized in that the casing has a cover (2) and a air guiding ramp (25) is arranged on the cover (2) that produces a continuous transition between cover (2) and exhaust (5).

5 18. Radial fan as claimed in claim 1, characterized in that the cover disk of the wheel has an axially placed air inlet port (3a) and the cover disk (3) on the edge (3b) of the air inlet port is bulged in an axial direction to the casing and a U-shaped profile (31) is provided at the circumference of the air inlet that engages with the edge (3b) of the air inlet port (3a) forming a seal.

10 19. Radial fan as claimed in claim 1 , characterized in that the bottom of the hollow cylindrical cup-shaped section (9) has e.g., an inclined, corrugated or curved shape that deviates from a straight plane.

20. Radial fan as claimed in claim 1, characterized in that the wheel has bore holes in the supporting disk (12) in the vicinity of the root of the blower to produce low pressure behind the supporting disk.  
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